



Mean Set of Claims for U.S. Application Serial No. 09/917,378

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What is claimed is:

1. A composition comprising a substantially purified mannanase A peptide, the mannanase A peptide comprising a catalytic domain GH5, a carbohydrate binding domain III, and a carbohydrate binding domain II.
2. The composition of claim 1 wherein the mannanase A peptide is further defined as comprising a linker and a signal peptide.
3. The composition of claim 1 or 2 wherein the first catalytic domain GH5 of the mannanase A peptide is further defined as having a length of about 370 to about 380 amino acids.
4. The composition of claim 1, 2, or 3 wherein the carbohydrate binding domain III of the mannanase A peptide is further defined as having a length of about 140 to about 160 amino acids.
5. The composition of claim 1, 2, 3, or 4 wherein the carbohydrate binding domain II of the mannanase A peptide is further defined as having a length of about 90 amino acids to about 110 amino acids in length.
6. The composition of claim 3 wherein the GH5 catalytic domain is further defined as the sequence of SEQ ID NO: 3.
7. The composition of claim 4 wherein the carbohydrate binding domain III is further defined as the sequence of SEQ ID NO: 4.
8. The composition of claim 5 wherein the carbohydrate binding domain II is further defined as the sequence of SEQ ID NO: 5.

9. The composition of claim 1 further defined as comprising a sequence of SEQ ID NO: 3, SEQ ID NO: 4, and SEQ ID NO: 5.
10. A mannanase A peptide having a sequence of SEQ ID NO: 1.
11. The mannanase A peptide of claim 10 further defined as having a sequence of SEQ ID NO: 2.
12. An industrial mixture suitable for degrading hemicellulose, such mixture comprising the mannanase A of claim 1.
13. The industrial mixture of claim 12 further defined as comprising a detergent.
26. An isolated polypeptide molecule comprising:
 - a) a sequence of SEQ ID NO: 3;
 - b) a sequence of SEQ ID NO: 4;
 - c) a sequence of SEQ ID NO: 5;
 - d) a sequence of SEQ ID NO: 1;
 - e) a sequence of SEQ ID NO: 2; or
 - f) an amino acid sequence having at least 70% sequence identity with the amino acid sequence of a), b), c), or d).
27. The polypeptide molecule of claim 26, having at least 90% sequence identity with the amino acid sequence of a), b), c), or d).
28. A fusion protein comprising the polypeptide of claim 26 and a heterologous peptide.
29. The fusion protein of claim 28, wherein the heterologous peptide is a substrate targeting moiety.

30. The fusion protein of claim 29, wherein the heterologous peptide is a peptide tag.

31. The fusion protein of claim 29, wherein the peptide tag is 6-His, thioredoxin, hemagglutinin, GST, or OmpA signal sequence tag.

32. The fusion protein of claim 29, wherein the heterologous peptide is an agent that promotes polypeptide oligomerization.

33. The fusion protein of claim 32, wherein the agent is a leucine zipper.

B1
34. A mannanase-substrate complex comprising an isolated polypeptide molecule comprising a nucleic acid sequence encoding a heterologous protein in frame with the polypeptide molecule of SEQ ID NO: 2 bound to hemicellulose.

B2
43. (Amended) A composition comprising a carrier and a polypeptide molecule comprising a nucleic acid sequence encoding a heterologous protein in frame with the polypeptide molecule of SEQ ID NO: 2.

44. A composition comprising the polypeptide molecule of claim 26 and a carrier.

B3
63. A method for reducing hemicellulose in a starting material, the method comprising:
administering to the starting material an effective amount of a polypeptide molecule of claim 26 or an isolated polynucleotide molecule comprising a nucleic acid sequence encoding a heterologous protein in frame with the polypeptide molecule of SEQ ID NO: 2.